



A.D. 1865, *24th JUNE.* N^o 1697.

S P E C I F I C A T I O N

OF

WILLIAM CLARK.

SMOKE-CONSUMING APPARATUS.

LONDON:

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Smoke-consuming Apparatus.

(This Invention received Provisional Protection only.)

PROVISIONAL SPECIFICATION left by William Clark at the Office of the Commissioners of Patents, with his Petition, on the 24th June 1865.—A communication from abroad by François Auguste Fouché Boiler Maker, and Claude Moret, Mechanician, both of 29, Boulevard St. Martin, Paris.

I, WILLIAM CLARK, of 53, Chancery Lane, in the County of Middlesex, Engineer and Patent Agent, do hereby declare the nature of the said Invention for “IMPROVEMENTS IN THE MEANS AND APPARATUS FOR CONSUMING SMOKE,” to be as follows:—

10 This Invention relates to an improved apparatus for consuming the smoke produced in the furnaces of stationary, locomotive, portable, or marine engines, or other furnaces generally. The improvements consist,

1st, in a perfect and complete method of purifying and subdividing the smoke, the solid parts being first separated, consisting of the carbon which
15 produces the smoke; 2ndly, the combustible gases, such as oxide of carbon, carburets of hydrogen, and hydrogen, are afterwards consumed afresh; and 3rdly, those parts are condensed which have been completely burnt and rendered inert such as carbonic acid and steam.

2ndly, in improved apparatus serving to effect the purification of the
20 smoke, and the separation of the combustible gases of which it is composed as above mentioned.

The Invention thus consists in the complete and continuous interception of the smoke before it escapes from the chimney, to effect its purification and

Clark's Improvements in Smoke-consuming Apparatus.

transformation by disengaging and eliminating the incombustible gases, the combustible gases being returned in a continuous manner under the fire where they are burnt and aid in the production of heat. These improvements are illustrated in the accompanying Drawing, which shows a sectional elevation of a smoke-consuming apparatus applied to a steam generator. 5

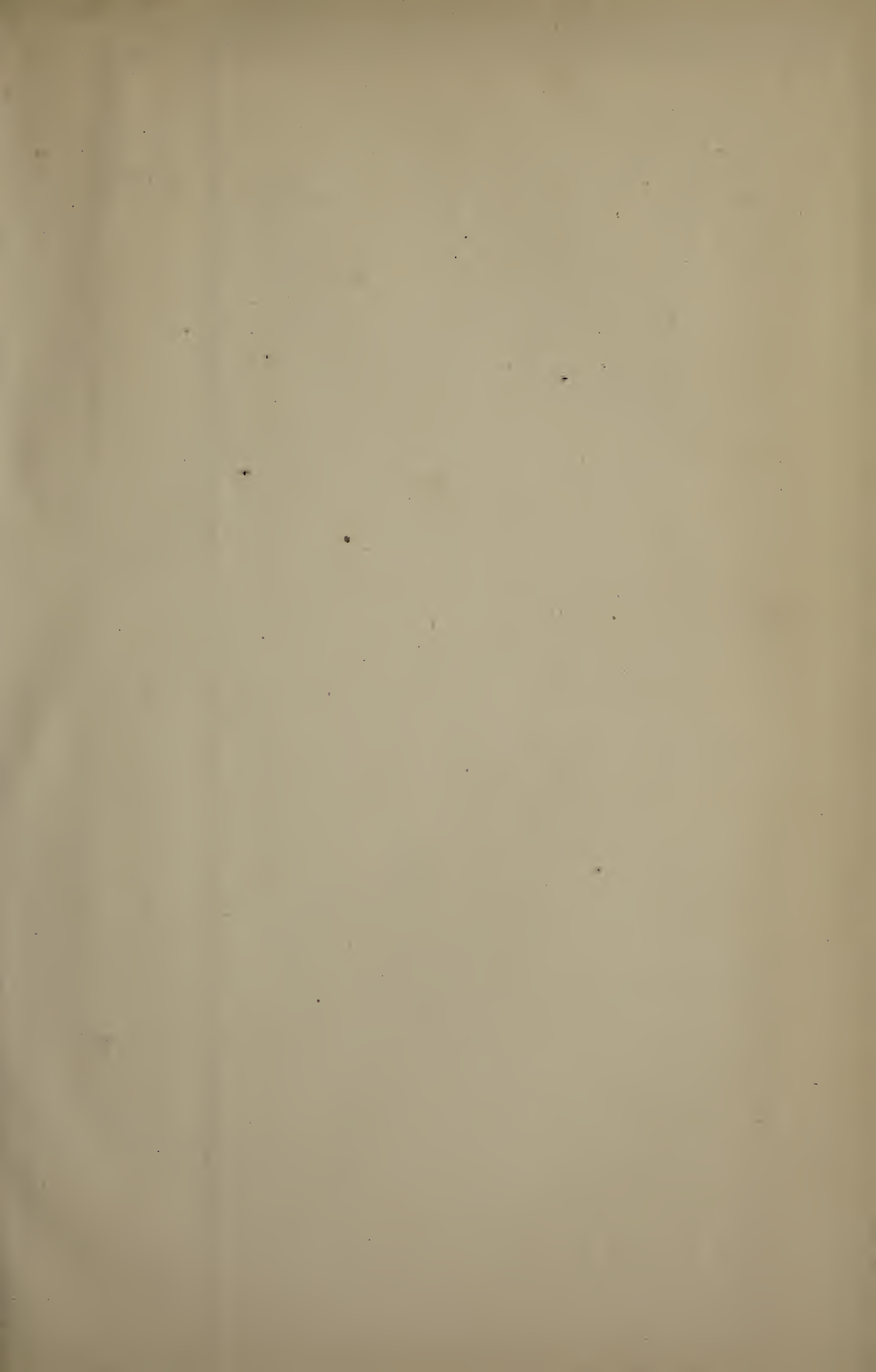
a represents the brickwork of the boiler furnace; *b*, chimney; *c*, furnace bars. The two latter parts, namely, the furnace and flue, are of the ordinary construction and do not require any modification to admit of the application of the smoke-consuming apparatus, which may be adapted thereto or removed at pleasure; *d*, sheet or other iron damper adapted to the chimney and cutting 10 off the passage of the smoke into the atmosphere; this damper is always closed, as except in cases of repairs or cleaning the boiler, this boiler furnishes sufficient steam during the night, so that the stoker has only to place the apparatus to work at the time the fire is lighted; *f*, chamber or recipient placed in communication with the chimney *b* by means of pipe *g* serving to 15 conduct the smoke; this chamber is filled with water, and the smoke on passing into it becomes deprived of its impurities, such as ashes and particles of coal that may escape from the combustion, which matters being heavier fall to the bottom of the receptacle, the smoke is also deprived of a portion of the steam it contains; this chamber may be supplied in a continuous manner, and 20 furnished with an overflow pipe for getting rid of the surplus water; a water guage may also be applied for indicating the rate and progress of the supply. *h*, draw-off cock for the liquid in the reservoir; *i*, apparatus for purifying the smoke; *j*, pipe connecting the apparatus *i* with reservoir *f*. This purifying apparatus is composed of a chamber divided at the upper part into compart- 25 ments consisting of perforated sheet iron *k*; on each of these is disposed lime in powder, mixed with hay, moss, or other similar spongy matters, through which the smoke is caused to pass and thereby become filtered and purified of the gases and carbonic acid and steam it contains; the carbonic acid combining with the lime transforms the latter into carbonate of lime; the smoke 30 which is then composed of combustible gases is finally washed in the milk of lime contained in the lower part of the apparatus, and passes out in a pure state through pipe *l* to an exhauster, into which it is drawn; *m*, emptying cock of the purifying apparatus; *n*, exhauster serving to draw the smoke through pipe *l*, and fixed on one side of the apparatus. One side of this apparatus is 35 open to admit of the introduction of a certain quantity of air which becomes mixed with the smoke, the whole is then forced through pipe *o* into the furnace under the fire-bars. The lower end of pipe *o* is expanded in the form of a fan in order that the smoke may be spread and distributed over all parts

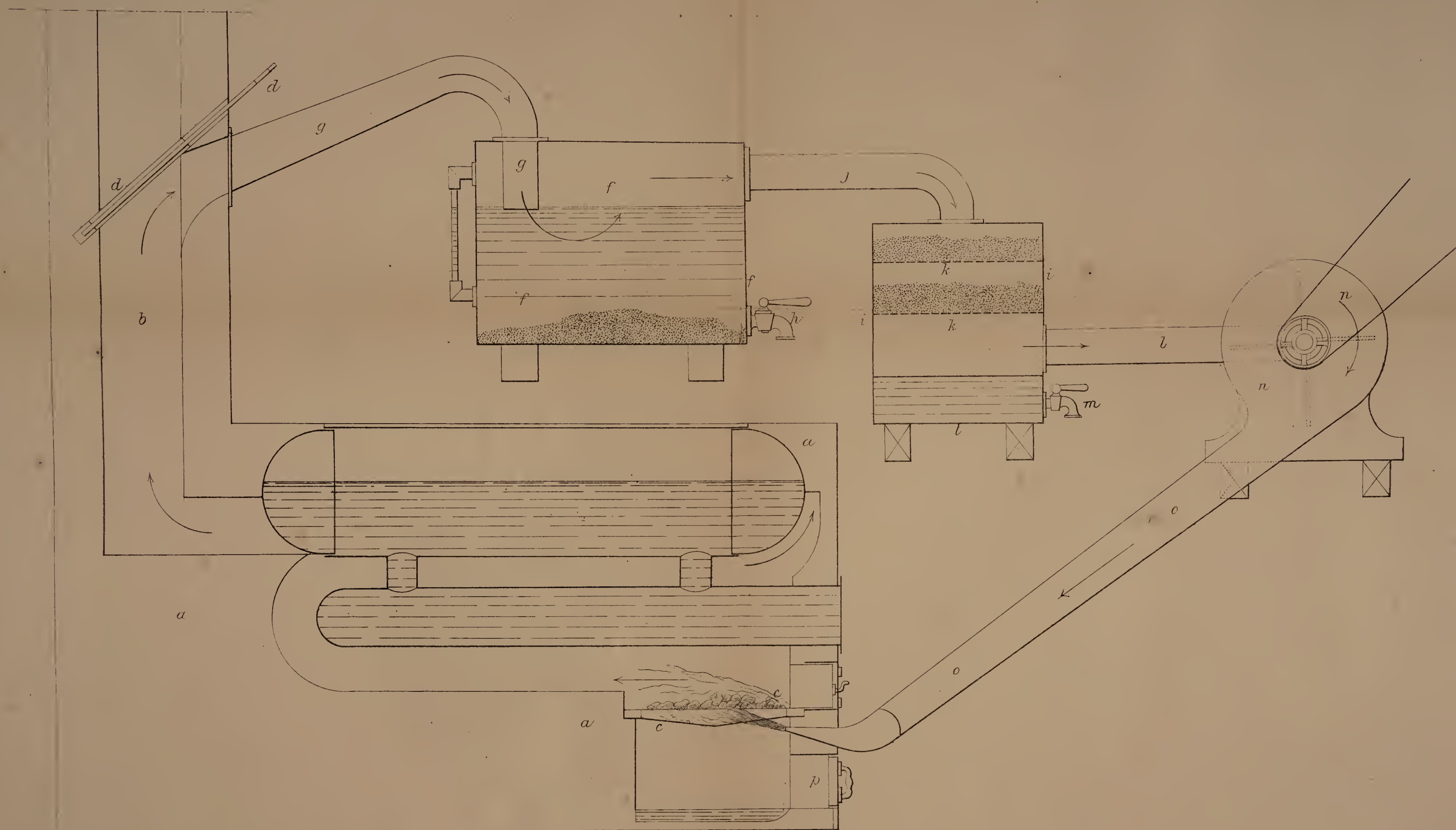
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of the furnace ; *p*, door hermitically closing the ash-pit. From the foregoing it will be readily understood that the operation is continuous, and the chimney being closed the smoke is forced to enter the apparatus *f*, *i*, and is thence drawn in a pure state through pipe *l* by means of the exhauster, where it
5 mixes with air and is forced to continue its circuit until it enters the furnace under the fire-bars for the purpose of maintaining and feeding the combustion ; a great economy in the fuel also results from the gases contained in the smoke being consumed in the furnace ; increased heat is also obtained, as with these improvements the smoke cannot escape into the atmosphere.

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The drawing left with Provisional Specification is partly colored.

Drawn on Stone by Malloy & Sons.

